

THURSDAY, NOVEMBER 11, 1875

SEVENTH REPORT OF THE SCIENCE COMMISSION

THE present Report deals with the University of London, the Universities of Scotland, the University of Dublin and Trinity College, and the Queen's University in Ireland. With regard to the University of London the Commission has few suggestions to make, though it is of opinion that the Matriculation Examination would have a still higher value than it has if a Practical Examination could be instituted in connection therewith. "The enforcement of a practical test would accelerate the introduction of practical work into school teaching, and would thus exert a very favourable influence on the Progress of Scientific Education."

The Commission is also of opinion that the University of London should follow the example of the University of Edinburgh, and award the degree of D.Sc. only to those who have given proofs of the desire and capacity to make some addition to scientific knowledge.

The greater portion of this Report refers to the Universities of Scotland. The Report begins by referring to the inquiry conducted by the Commissioners appointed under the Universities (Scotland) Act of 1858, and to the reforms instituted by them. The recommendations made by this Commission were, however, controlled by the fact that the sum to be provided by Parliament to carry them out would not exceed 10,000*l.* a year. The Universities Commission kept very much, therefore, to the old lines, making classical learning the foundation of a University course, and prescribing for graduation in arts, a course extending over four winter sessions, and including "attendance on the Classes of Humanity, Greek, Mathematics, Logic, Moral Philosophy, and Natural Philosophy:" and, in addition to these, "attendance on a course of English Literature," which previously had not been required in any Scottish University except that of Edinburgh.

The Commission observes with satisfaction that in the Scotch Graduation Examination it is clearly recognised that a fair training both in literature and in science is the best basis for further advances in either the one direction or the other. They suggest, however, that the student should be allowed to show the required proficiency, whether in science or literature, by passing an examination at such a period in his University career as will enable him, in the latter part of his academical course, to devote his attention systematically to a particular group of subjects.

In referring to the examinations for the degrees of Bachelor and Doctor of Science, the Report states that recently a regulation has been made at Edinburgh that each candidate for the degree of D.Sc. must submit a thesis containing "some original researches on the subject of his intended examination, and such thesis must be approved before the candidate is allowed to proceed in his examination." It seems quite astonishing that this, which has for generations been the rule on the Continent, has not been done in all our Universities long ago. Degrees of an essentially similar kind have been instituted in Glasgow.

The most important part of the Report on the Scottish Universities is concerned with the deficiencies in respect to assistants and apparatus. In some cases the rooms are not at all adapted to the kind of teaching that must be carried on in them. The laboratory accommodation is throughout glaringly deficient, and ill-adapted for practical work. Indeed, if we except Glasgow, where new buildings have recently been erected, practical teaching can scarcely be said to exist, and now that it has come to occupy so large a space in the higher education, it is not to be wondered at that the scientific professors feel completely hampered in carrying on their work. Happily, in the case of Edinburgh this state of matters is likely soon to be remedied; 80,000*l.* have been already subscribed to build a new medical school, so as to leave the present buildings for the other departments of the University.

With regard to assistants, all the Universities are also miserably deficient, the deficiencies being attributable to the inadequacy of their resources. There are certain funds available for assistants to the scientific as well as to the other professors, but these are so scanty that in some cases the science professors have to provide additional assistants out of their by no means munificent incomes. The apparatus also, in connection with the scientific chairs, is discreditable to the Universities and quite inadequate to the modern requirements of scientific teaching.

In the case of the Universities of Edinburgh, Glasgow, and St. Andrews, the Commissioners recommend that Government augment their grant sufficiently to enable the Universities to increase the number, and, in some cases, the emoluments of assistants; to make more ample provision of apparatus for teaching; and to revise the salaries of the scientific professors.

In the case of Edinburgh it is recommended that such assistance be given, both in the form of a capital sum in aid of a scheme of extension, and of an annual grant.

The Report also deals shortly with the Andersonian Institute, or "Anderson University" of Glasgow, founded under the will of John Anderson, Professor of Natural Philosophy in Glasgow University towards the close of last century. There is no doubt it does good work among those who cannot afford a regular University education; many students in Arts and Medicine get their education here. It has been suggested that this Institute receive a charter, but the Commissioners wisely decline to support such a suggestion.

A movement was set on foot some time ago to establish a Science School at Dundee, about twelve miles from St. Andrews, across the Firth of Tay, which is being bridged for a railway. The Commissioners, however, cannot recommend any scheme which would involve the St. Andrews professors travelling to and from Dundee to teach, or which would remove the scientific chair to that town.

For some reason the University of Aberdeen has declined to avail itself of the opportunities afforded it of tendering evidence before the Commission.

With regard to the two Irish Universities, that of Dublin and the Queen's University, the Commissioners report very favourably on the portion allotted to science in these two institutions.

In the Dublin University there are thirty-three fellowships, which are tenable for life, irrespective of the restriction of celibacy, and are now open to all without distinction of creed. The Commissioners think that it would be very desirable that in the election to Fellowships important original research should be regarded as a substantial element of merit.

The nature of the constitution of the Queen's University, Ireland, and its three colleges at Belfast, Cork, and Galway, is well known. The education to be obtained at these colleges is fairly complete, both on the scientific and literary side, and the examinations imposed by the University are such as to make its degrees of real value.

The evidence shows that the appliances for teaching are in some respects insufficient, and that there is a serious deficiency of funds for maintaining the efficiency of the Queen's Colleges in this respect. The Report concludes and recommends as follows with regard to the Queen's University in Ireland :—

"In founding the Queen's Colleges, the State did not adopt the principle of assisting and stimulating local efforts, and if we except the exhibitions and prizes, to which reference has been already made, as having been provided by public subscription, and a few other exhibitions which have been founded at Belfast, no voluntary contributions have been received by them. They are institutions for which the State has made itself responsible, and in which, as part of a University system, a complete scientific training is implied.

"As we think it of great importance that the sanction of the State should not be given to the teaching of science on a scale inadequate to ensure its efficiency, we recommend (1) That an increased annual grant be made to the Queen's Colleges for the purpose of providing assistants, apparatus, and the other necessary appliances of practical scientific teaching. We further recommend (2) that the Professorship of Natural History in the Queen's College, Belfast, be separated from that of Geology and Mineralogy."

The general conclusion reached, then, in this Seventh Report is that it would take very little to make London University nearly perfect as an examining and degree-granting body; that Dublin University is in a healthy condition, and by a little amendment in the subjects of examination for her Scholarships and Fellowships, she might be an example to her sister Universities in England; that the Queen's University, Ireland, and the four Scottish Universities are all working in the right lines, and that what they mainly require in order that they may develop into perfectly efficient teaching bodies, so far as science is concerned, are funds to provide the necessary men, buildings, and apparatus. No doubt the recommendations of the Commissioners in reference to these and other matters will receive serious attention in the proper quarter.

HERMANN'S "ELEMENTS OF HUMAN PHYSIOLOGY"

Elements of Human Physiology. By D. L. Hermann, Professor of Physiology at the University of Zurich. Translated by Arthur Gamgee, M.D., F.R.S. (London: Smith, Elder, and Co., 1875.)

FOR a considerable time a first-class work on the Elements of Physiology in our own language has been a desideratum. The bulky Handbook by Carpenter

was framed in a nearly bygone era of the science; Kirkes' smaller volume is under a similar disadvantage; Huxley's excellent little book does not appeal to others than beginners, and the "Handbook to the Physiological Laboratory," by Drs. Sanderson, Foster, Brunton, and Klein, was never intended to fill the place of a manual. Dr. Gamgee steps forward to fill the gap with a carefully conducted and excellent translation of the fifth edition of Prof. Hermann's deservedly esteemed "Elements of Physiology," a work unequalled in the care which has been bestowed on the collecting and balancing of the investigations of authors from all quarters, as well as in its general construction and inherent unity of design.

Dr. Gamgee tells us, "After much hesitation and many doubts I decided not to annotate the text, for had explanatory notes, of the nature of commentaries with illustrations, been added to it, as I once intended, its appearance would have been still further delayed, and the work would have been materially altered in character—it would have ceased to have been Hermann's Physiology." We have a sufficiently high estimation of Dr. Gamgee's ability to think that the English-reading public are the sufferers from his change of determination. The work being Hermann's therefore, and not in any way Gamgee's, except as far as the translation is concerned, our remarks apply only to the former.

The subject is treated in four sections, or parts. The first is entitled "The Exchanges of the Matter of the Organism"; the second, "The Activities or Energies of the Body"; the third, "The Liberating Apparatus; the Nervous System"; and the last, "Origin, Development, and Death of the Organism." As in most works on general subjects written by authors with any special predilections, the space devoted to the different functions is not quite that which would suggest itself to the unbiased reader. As an instance of this in the present case we may refer to the fact that the account of the organ of sight alone occupies more than one-eighth of the volume, and nearly three times as much space as that devoted to the circulation of the blood.

The first part treats of the chemical constituents of the human body, the blood, and the circulation. The most advanced method of notation is adopted, and Baeyer's observations on the relations of uric acid are incorporated.

In the chapter on the blood we find one section devoted to the death of that fluid, the expression being employed to indicate those effects which follow its withdrawal from the influence of the walls of the living vessels. With reference to the movement of the blood in the circulatory system, we cannot help feeling that there is considerably more that might have been said about it with advantage, and that it might have been treated in a more connected and precise manner. Too much stress is laid on the aspiratory power of the thorax, which is assumed to be so continuous that "an ordinary expiration merely removes the inspiratory increase of the negative pressure." The duration of the systole of the ventricles of the heart is said not to vary with differences in the pulse-rate, according to the observations of Donders, which have been since shown to be incorrect. We are also led, incorrectly, to infer that the blood-pressure in the ventricles at the end of the diastole is a negative one; that the